

PRELIMINARY TAXONOMIC STUDIES IN THE PALM GENUS SCHEELEA KARSTEN\*

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The genus Scheelea was originally established by Karsten (1857) in which he described four species and transferred three others from Attalea and Maximiliana. In 1861 and 1866, Karsten also published illustrations of the species he described. During the next several decades, other taxa of Scheelea were described or transferred from other genera (mainly Attalea) to Scheelea by Barbosa Rodrigues (1891, 1894, 1898, 1899, 1903, 1907), Hooker (1897), Beccari (1916), Burret (1929, 1934, 1940), Bailey (1933, 1947), Bartlett (1935), and Dugand (1959).

Undoubtedly, the most comprehensive study of Scheelea was done by Burret (1929). In the same article he also treated the genera Attalea, Orbignya and Maximiliana. Besides describing 13 new species of Scheelea and transferring 8 others to the genus from Attalea and Maximiliana, he divided Scheelea into two sections, Synalphocaryum Burret and Dialphocaryum Burret. In the first section (characterized by having very large endocarp fibers distributed in dense clusters, and 1-5 closely arranged female flowers on each androgynous rachilla) Burret includes 23 species, and in section Dialphocaryum (differentiated by having endocarp fibers about one-half as small and distributed in smaller clusters, and 5-many loosely arranged female flowers per androgynous rachilla) 15 taxa are listed. Burret also constructed a partial key to the species within the first section, and a more or less complete key to those in the second section. In the same article, Burret emphasized the pitfalls involved in undertaking a comprehensive study of Scheelea because a number of the taxa are based on incomplete descriptions as well as inadequate herbarium material.

Wessels Boer (1965, 1972) treated all species of Scheelea, as well as other closely related genera (Attalea, Orbignya, Maximiliana, Parascheelea and Markleya), as part of the genus Attalea, sensu lato. Glassman (1977a, 1977b) published preliminary studies of the first two genera; and all six genera in the Attalea complex were discussed and differentiated in Glassman (1977a).

As previously mentioned for Attalea and Orbignya in Glassman (1977a, 1977b), preparation of this study was very difficult because type specimens are frequently fragmentary or non-existent, very few additional collections have been made for each species, and because descriptive and illustrative information is often inadequate.

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The following is a description of the genus Scheelea: tall trees (several taxa up to 30m. or more) mostly with relatively smooth trunks and inconspicuous leaf scars, or lacking trunks (acaulescent or nearly so); leaves usually very long (averaging 5-10 m.), pinnately compound, leaf base conspicuous, petiole frequently short, sometimes absent, with fibrous margins; middle pinnae single in several taxa, but more commonly clustered; plants monoecious (occasional plants with only functional male flowers or only functional female flowers), flowers unisexual, both male and androgynous spathes woody and deeply sulcate, usually terminating in a fairly long umbo; androgynous spadices usually with many branches (rachillae), each branch with few to several (to as many as 20) female flowers along basal part forming triads with two male flowers, the terminal part becoming slender, bearing only male flowers which are frequently sterile; female flowers 2.0-3.5 cm. long, subtended by two bracts, with 3 subequal or equal convex imbricate sepals and 3 similar petals, pistil with a well developed staminodial ring surrounding the ovary, carpels 3-several, fused, stigmas 3-6, style short or absent; male spadices many branched, male flowers usually spirally arranged around rachillae, sometimes on one side of the rachillae; male flowers 5-19 mm. long, with 3 very short sepals and 3 much longer fleshy, plano-convex or terete petals, stamens always 6, included in the petals, anthers straight; fruits 4-10 cm. long, mostly ovoid, 1-5 seeded, exocarp fibrous, mesocarp usually pulpy and fibrous, endocarp stony, usually more than twice as thick as exocarp and mesocarp combined, usually dotted with clusters of fibers, persistent perianth and staminodial ring enlarged in fruit; seeds conforming to size and shape of locules, endosperm homogeneous.

A total of 47 taxa have been described or transferred under the name Scheelea. Of this number, I am presently recognizing 28 "good" species of Scheelea (includes 11 synonyms); and the remaining eight taxa have been relegated to species dubiae or species incertae.

The following key, based on specimens examined plus descriptions and illustrations, encompasses 27 species of Scheelea. Unfortunately, S. tessmannii could not be included because of lack of leaf material. The reader should keep in mind, however, that this key is based on preliminary studies, and hopefully a more satisfactory revised treatment will be presented in the future.

Subsequent to the key, the group of "good" species as well as the doubtful or uncertain species, are arranged alphabetically with the author and original place of publication. Sometimes, other pertinent articles are listed, as well. Complete citations of most of these plus other articles mentioned in the text are listed under LITERATURE CITED at the end. Pertinent synonyms are also included. The type of each species, when known, is listed and is followed by a list of cited specimens examined

by the present author. Holotypes, isotypes, and lectotypes are specifically listed as such; however, when its status is uncertain it is merely called "type". For each specimen, collector's name and collecting number is followed by a symbol of the herbarium where the collection is deposited. Abbreviations of herbaria used here are those listed in "Index Herbariorum" by Holmgren and Keuken (1974).

Key to Species of Scheelea

1. Middle pinnae not clustered
  2. Male flowers 9-14 mm long
    3. Middle pinnae 3-4 cm wide, about 90 cm long, fruits 6-7 cm long..... S. kewensis
    3. Middle pinnae 4-6 cm wide
      4. Mature fruits yellow, 4-5.2 cm x 2.8 cm, male flowers 10-14 mm long, middle pinnae about 150 cm long, 5-6 cm wide.....-..... S. butyracea
      4. Mature fruits yellowish, finally becoming orange, 6.0-7.5 cm x 3.2-4.5 cm, male flowers 9-12 mm long, middle pinnae 75-100 cm long and 4-5 cm wide..... S. magdalenica
  2. Male flowers 14-20 mm long
    5. Mature fruits 5-6 cm long and 2-3 cm in diam, one-seeded
      6. Rachis of leaf about 3.5 m long, male flowers 15-20 mm long..... S. preussii
      6. Rachis of leaf 6-9 m long, male flowers 13-16 mm long
        7. Rachis of leaf 7-9 m long, petiole about 120 cm long, 16-19 female flowers per androgynous rachilla..... S. rostrata
        7. Rachis of leaf about 6 m long, petiole 30-60 cm long, 12-14 female flowers per androgynous rachilla..... S. zonensis

5. Mature fruits 6-9 cm. long and 4-5 cm. in diam., 1-3 seeded
8. Male flowers 13-15 mm long, middle pinnae 100-120 cm long, 5-10 female flowers per androgynous rachilla..... S. macrocarpa
8. Male flowers 13-19 mm long, middle pinnae 100-160 cm long. 10-20 female flowers per androgynous rachilla..... S. osmantha
1. Middle pinnae in clusters of 2-5
9. Plants acaulescent, middle pinnae 40-98 cm long and 2.8-5 cm wide
10. Male flowers 5-8 mm long, mostly arranged on one side of the rachilla
11. Middle pinnae about 2.8 cm wide and 40 cm long..... S. parviflora
11. Middle pinnae 4.5-5 cm wide and 90 cm. long.
12. Rachis of leaf 9-10 m long, male flowers 5-6 mm long..... S. weberbaueri
12. Rachis of leaf 5.3 m long, male flowers about 8 mm long... S. anisitsiana
10. Male flowers 9-13 mm long, mostly spirally arranged around rachilla
13. Rachillae of male spadix about 18 cm long, rachis of leaf about 4 m long, branched part of androgynous spadix 21-38 cm long..... S. attaleoides
13. Rachillae of male spadix about 9 cm long, rachis of leaf about 5.6 m long, branched part of androgynous spadix 30-50 cm long ..... S. lauromuelleriana
9. Plants with trunks 3-45 m tall, middle pinnae 60-150 cm long and 2-6.5 cm wide
14. Male flowers 6-10 mm long
15. Middle pinnae 3-4 cm wide, 60-90 cm long

16. Male flowers spirally arranged around rachilla..... S. princeps
16. Male flowers arranged on one side of rachilla
17. Middle pinnae about 4 cm wide and 70 cm long, each androgynous rachilla with about 8 female flowers..... S. phalerata
17. Middle pinnae about 3 cm and 90 cm long, each androgynous rachilla with 1-2 female flowers..... S. microspadix
15. Middle pinnae 4-6 cm wide and 100-150 cm long
18. Male flowers arranged on one side of the rachilla, middle pinnae about 6 cm wide and 100-150 cm long..... S. amylacea
18. Male flowers spirally arranged around rachilla, middle pinnae 4-5 cm wide and 100-125 cm long
19. Rachillae of male spadix 7-10 cm long, rachillae of androgynous spadix with one female flower, trees 10-15 m tall..... S. huebneri
19. Rachillae of male spadix 10-14 cm long, rachillae of androgynous spadix with 2-4 female flowers, tree up to 3m tall..... S. leandroana
14. Male flowers 11-18 mm long
20. Mature fruits 9-10 cm long, 3-4 seeded
21. Rachillae of male spadix 17-34 cm. long, trees about 12 m tall..... S. bassleriana
21. Rachillae of male spadix 10-13 cm long, trees 3-4 m tall..... S. cephalotes
20. Mature fruits 4-7 cm long, 1-3 seeded
22. Rachillae of male spadix 10-25 cm long, middle pinnae 60-90 cm long

23. Rachillae of male spadix about 10 cm long, fruits 4-4.5 cm long, middle pinnae 2.2 cm wide..... S. macrolepis
23. Rachillae of male spadix 14-25 cm long, fruits 5-7 cm long, middle pinnae 4-5 cm wide
24. Rachis of leaf 4.5-7.5 m long, middle pinnae about 90 cm long, fruit 2-3 seeded..... S. excelsa
24. Rachis of leaf 2.5-3 m long, middle pinnae about 60 cm long, fruit one seeded..... S. insignis
22. Rachillae of male spadix 25-40, middle pinnae 100-140 cm long
25. Middle pinnae 100-140 cm long, 5.0-6.5 cm wide, male flowers 12-18 mm long
26. Middle pinnae about 5 cm wide, mature fruits 4-6 cm. long and 2.0-2.7 cm in diam ..... S. liebmannii
26. Middle pinnae 6.0-6.5 cm wide, mature fruits 6.3-6.6 cm long and 2.8-3.4 cm in diam ..... S. lundellii
25. Middle pinnae about 100 cm long and 4.5 cm wide, male flowers 11-14 mm long... S. maracaibensis

SCHEELEA Karsten, Linnaea 28: 264. 1857. ATTALEA sect. Pseudo-Scheelea Drude, 1881; MAXIMILIANA sect. Scheelea Drude, 1887; ATTALEA subgen. Scheelea Drude, 1887; ENGLEROPHOENIX Kuntze, 1891 (in part).

Type species: S. attaleoides Karsten.

#### Alphabetical List of Species

S. amylacea Barb. Rodr., Pl. Nov. Cult. Jard. Bot. Rio de Janeiro 1: 17, t. 5A, t. 6. 1891; t. 45B, 1903.  
Lectotype: Brazil, native origin not indicated, cult. in Jard. Bot. Rio de Jan. no. 151 (Glaziou 17340-P). c.f. Burret 1929, p. 663.

Specimens examined: Brazil, cult. Jard. Bot. Rio de Jan., Glaziou 16484 (P); Glaziou 17340 (P, lectotype; BR, C, isoelectotypes); Dahlgren & Miller s.n. (F-611598, 611601); H. A. Johnstone 1838, 1840, 1842 (B). Doubtful: Brazil, Jard. Bot. Lagoa de Freitas, Glaziou 16486 (BR, MO, P); Glaziou 16489 (P).

Vernacular names: Anaja', Catole'.

Distribution: known only from cultivation.

Barbosa Rodrigues (1891, 1903) did not cite any specimens, but only listed the number of a tree growing in the botanical garden. In his Index of American Palms, Glassman (1972) mentioned t. 5A and t. 6 as the type for this species, however since Burret (1929) cited Glaziou 17340 in his detailed study of Scheelea it is more appropriate that this specimen be chosen as the lectotype of S. amylacea.

Apparently, S. amylacea is distinct because it is one of several species of Scheelea with male flowers arranged on one side of the male rachillae (also characteristic of S. microspadix, S. parviflora, S. phalerata and S. weberbaueri) rather than being spirally arranged around the rachillae.

S. anisitziana Barb. Rodr., Palm. Matogross. 63, t. 20. 1898 ("anizitziana"); t. 47B. 1903.

Lectotype: Brazil, MatoGrosso, and cult. Assuncion, Paraguay (t. 20, 1898).

Vernacular names: none recorded.

Distribution: Reported from MatoGrosso in Brazil.

Barbosa Rodrigues (1898) cited number 223 as the type, but this specimen has not been located. Hence, the selection of t. 20 as the lectotype.

Burret (1929) says that this species resembles S. phalerata, especially in the description of the petiole.

Even though the description is incomplete (no fruits or androgynous spadix) and no specimens have been seen, a distinct species seems to be indicated. It is hoped that collections of Scheelea made in Mato Grosso and Goias during the summer of 1976 by the present author will be useful in clarifying the limits of S. anisitziana as well as other poorly known species (S. microspadix and S. phalerata) described from these two states.

S. attaleoides Karsten, Linnaea 28: 265, 1857; t. 67. 1861;

Dugand Caldasia 7: 145-146, 1955.

Lectotype: New Granada (Colombia), Prov. Bogota, Llano de San Martin, 300 m., "Yagua", 1851-1857 (J. Triana 731-P).

Specimens examined: Colombia, Prov. Bogota, Llano de San Martin, J. Triana 731 (P, lectotype): Intendencia del Meta, 20 km. S.E. of Villavicencio, 500 m, dense forest, Killip 34270 (COL, US); Meta, Monte de Rio Meta, Puerto Lopez, alt. 200 m., F. J. Hermann 11208-1/2 (COL, US); Intendencia del Meta, Llanos orientales, entre Villavicencio y el Rio Ocoa, 450 m. alt., Dugand & Jaramillo 2915 (COL).

Doubtful: Colombia, Los Llanos, Rio Meta, Umapo,



Cuatrecasas 3654 (COL); Selva del Caño Popore (Apaporis-Vaupés), 240 m. alt., Cuatrecasas 7101 (COL).

Vernacular name: Jagua

Distribution: Colombia, principally in the province of Meta.

Karsten cited no specimens in either of his articles, but gave the following information for the type locality: "Vallis orinocensis margines pede andium Bogotensium, alt. 400 m." According to Dugand (1955), the above includes the Intendencia del Meta, on the foot of the eastern Andes and the Llanos that were previously called "San Martín", and the banks of the Alto Meta and its affluents called "Rio Negro". In 1972, I listed t. 67 of Karsten as the type of this species. At the time I was not aware of the existence of Triana 731 (P), especially since Dugand did not cite it. This specimen was collected within the general area of the type locality, probably during or close to the same time period when Karsten visited the area in 1853. Therefore it seems appropriate to choose Triana 731 as the lectotype instead of t. 67. The collection consists of leaf parts (including middle pinnae), and parts of a male spadix with male flowers and an androgynous spadix with female flowers.

As previously mentioned, S. attaleoides is the first taxon described by Karsten in Scheelea, and hence is the type species of the genus.

S. bassleriana Burret, Notizbl. 10: 655. 1929.

Holotype: Peru (Dept. Loreto), Middle Ucayali, Yarina Cocha, alt. 155 m., in flood free highland (G. Tessmann 5490-B).

?S. brachyclada Burret, Notizbl. 10: 680. 1929.

Lectotype: Peru (Dept. Loreto), Lower Itaya, Soledad, flood-free high forest, alt. 110m. (G. Tessmann 5237-F); c.f. Glassman 1972, p. 202.

?S. stenorhyncha Burret, Notizbl. 10: 675. 1929.

Lectotype: Peru, Dept. Loreto, flood free high forest on lower Itaya near Soledad (Tessmann 5256-F).

Specimens examined: Peru, Loreto, Rio Ucayali, Yarina Cocha, G. Tessmann 5490 (B, holotype of S. bassleriana; NY, US, isotypes); Lower Itaya, Soledad, G. Tessmann 5237 (F, lectotype of S. brachyclada; NY, isolectotype); Tessmann 5256 (F, lectotype of S. stenorhyncha). Doubtful: Peru, Yarina Cocha, G. Tessmann 5439a (NY).

Vernacular names: Chebon (S. bassleriana), Shapaja (S. brachyclada, S. stenorhyncha)

Distribution: Peru, mainly in Dept. of Loreto.

The holotype of S. bassleriana only consists of a mature fruit, whereas the isotypes comprise leaf material and packets of male flowers.



At present, I am not certain if S. brachyclada is actually synonymous with S. bassleriana. The holotype from (B) was probably destroyed, while isotypes from (F) and (NY) and a photo from (G) consist only of androgynous rachillae with both female and male flowers. For this species Burret (1929) also cited in the same article Tessmann 5493, Peru, Middle Ucayali, Yarina Cocha, alt. 155 m., flood-free high forest. The above specimen, consisting of male rachillae with flowers and a water color of the fruit, was probably destroyed at Berlin because I have not been able to locate it. Because of inadequate collections and the incomplete description (e.g. size of trunk, size of leaf and size of pinnae not described), I considered placing S. brachyclada in species dubia; but I surmised that it may be the same as S. bassleriana since Tessmann 5493 was collected in the same locality as the holotype (Tessmann 5490) of the latter taxon.

In spite of the fact that S. stenorhyncha is poorly known (no description of leaves, female flowers or male and female spadices) I am including it here in synonymy because it has the same locality as S. brachyclada. The holotype from (B) was apparently destroyed, hence the selection of Tessmann 5256 (F) as lectotype.

Scheelea bassleriana is one of four species of Scheelea I am recognizing from Peru. It is distinct from S. weberbaueri in the larger male flowers (12-17 mm rather than 5-6 mm) and from S. tessmannii by the shorter male rachillae; however, it seems to be most closely related to S. cephalotes, differing mainly in dimensions of various plant parts.

S. butyracea (Mutis ex L. f.) Karsten ex Wendl., in Kerch.

Palm. 241, 256. 1878; Dugand, Caldasia 1: 24-29. 1941.

Cocos butyracea Mutis ex L. f., Suppl. plant. 454. 1781.

Type: Colombia, (Dept. of Tolima) near the mines of Ibagué (observed by D. Mutis, but no specimens cited).

?S. regia Karsten, Linnaea 28: 266. 1857; Fl. Colomb. 2: t. 176, fig. 1-6. 1866.

Lectotype: Colombia, in warm valleys of Rio Magdalena and Cauca, up to 1,000 m. alt. (t. 176, fig. 1-6. 1866).

?S. humboldtiana (Spruce) Burret, Notizbl. 10: 658. 1929; Dugand, Caldasia 7: 147. 1955. Attalea humboldtiana Spruce, Journ. Linn. Soc. 11: 163. 1871.

Holotype: Venezuela, on the Orinoco above the waterfall, and Colombia, Rio Cassiquiare, above the mouth of Vasiva Lake (Spruce 43-K).

S. dryanderæ Burret, Notizbl. 11: 1049. 1934.

Holotype: Colombia, Dept. Valle del Cauca, Ebene bei Cali (Frau E. Dryander 12-B).

Specimens examined: Colombia, Dept. Cundinamarca, near Melgar, alt. 1,500 ft., M. B. Foster & R. Foster 1891

(A, COL); Nocaima, Hacienda Tobia, H. Garcia-Berriga 10674 (COL); Dept. Valle, cañon ebene bei Cali, Frau E. Dryander 12 (B, holotype of S. dryanderae): Cali, E. Dryander s.n. (COL); Zarzal, E. Dryander s.n. (B); Caicedonia, alt. 1,300 m., J. M. Duque-Jaramillo 4588 (COL). Doubtful specimens: Lower banks of Casiquiare & Orinoco, "Palma Yagua", R. Spruce 43 (K, holotype of Attalea humboldtiana; F, isotype). Colombia, Rio Hacha, 1844, J. Linden 1641 (P); without locality. E. Perez Arbelaez 10226 (COL); Dept. Caldas, La Dorada, Rafael Vanegas 1 (COL); Comisaria del Putumayo, selva hygrophila del Rio Putumayo, Puerto Ospina, J. Cuatrecasas 10858 (COL); Comisaria del Caqueta, between Florencia & Venecia, sabanas, J. Cuatrecasas 8945 (COL). Venezuela, Cumana, 1833, Bonpland s.n. (P); Territ. Amazonas, Isla Raton, disturbed mesophytic forest, Wessels Boer 1912 (U).  
 Vernacular names: Palma de Vino, Palma de Cuesco, Palma Real, Palma de Puerco, Corozo de Puerco, Marano, Corozo de Marrano, Palma dulce (Colombia).  
 Distribution: Colombia, especially in the departments of Tolima, Cundinamarca, Caldas and Valle; and Venezuela?

No specimens were cited by Mutis in his original publication nor could any specimens be found relating to his description of Cocos butyracea.

According to Dugand (1941), Burret (1929) included in S. butyracea another species of Scheelea growing in the Caribbean region of Colombia (Sierra Nevada de Santa Marta, Dept. of Magdalena). Burret cited Schultze 707 which was the basis for the description of a new, distinct species, S. magdalenica Dugand in 1959.

Dugand (1941) further stated that the type locality of S. butyracea is actually in the Dept. of Tolima, in the Alto Magdalena region closer to the Pacific coast. Today, this palm is rather scarce near Ibagué itself, but is common in the lower Llanos of Tolima between Rios Cuello and Magdalena. It is also found in neighboring foothills of the Cordillera Central, Dept. of Cundinamarca, up to 1,300 m., in regions of Guaduas, La Esperanza, El Colegio and Melgar. Humboldt and Bonpland (H.B.K. 1816, p. 301) also observed this species in Melgar as well as other localities in Tolima and Cundinamarca. Dugand distinguishes S. butyracea from the Caribbean Scheelea (S. magdalenica) primarily by the fruits being yellow at maturity, smaller (5.2 x 2.8 cm) and with a perianth about 2.2 cm long; rather than larger (5.2-7.5 x 2.8-4.8 cm), yellow-orange or orange-red fruits with a perianth 3 cm long. He suggests that comparisons should be made with living plants because the color of mature fruits are important, distinct and constant characters.

In La Dorada (Dept. of Caldas), S. butyracea is called "palma real", the same as in certain parts of Cundinamarca. Dugand said this was significant in explaining the identity of S. butyracea with S. regia because in a trip to Cartago, in the Valle del Cauca, he was told that the "palma real" of that region was no different than S. butyracea of Tolima. Even though the type locality of S. regia is rather general (valleys of Magdalena and Cauca), Karsten did visit La Dorada and Guaduas where he saw this palm and he possibly received specimens from Cartago through Triana, as well. The fruits of S. regia are described by Karsten as yellow and small (4 cm.) which is further evidence that both species are conspecific. Unfortunately, no specimens were cited by Karsten in either article, nor could any be found; hence an illustration was chosen as the lectotype for S. regia. If indeed, S. butyracea and S. regia are synonymous, then the latter becomes the correct name because of an earlier publication date (1857 vs. 1878).

Karsten (1857) described S. excelsa as growing with S. regia in the same localities (warm valleys of Rio Magdalena and Cauca, up to 1,000 m. alt). In visits to Alto Magdalena and Valle del Cauca, Dugand (1941) stated that he observed only one species of Scheelea, namely S. butyracea. It is probable that in his trip from Rio Magdalena to Baranquilla, Karsten made collections of S. excelsa either in the middle or lower (Bajo Magdalena) part of this region. No specimens are available to verify this assumption, however. Nevertheless, Dugand observed (but did not collect) a palm in the middle Magdalena region (between Honda and El Banco) which is distinct from the one in Alto Magdalena (S. butyracea) and from the Scheelea in the Caribbean coastal region (S. magdalenica). Karsten's description of S. excelsa is incomplete, but the pinnae are clustered (which distinguish it from the other two species) and the fruits are about 6.5 cm x 2.5 cm (estimated from the illustration) and appear to be immature. Until more collections are made from the middle Magdalena region and until the type locality of S. excelsa can be more precisely fixed, the status of this species will remain doubtful.

When Burret described S. dryanderæ ("Palma de Puerco") from Valle del Cauca, he had no clear view of S. butyracea (Dugand, 1941). Fruits sent by Frau Dryander to Dugand from the type locality were identical to those of S. butyracea; hence S. dryanderæ was reduced to synonymy.

Wessels Boer (1972) transferred S. butyracea to the genus Attalea, but this combination is invalid because the basionym, Cocos butyracea, was not cited (article 33, 1961 of International Code of Botanical Nomenclature - see Stafleu et al. 1972).

In his unpublished manuscript on Venezuelan palms, Wessels Boer includes S. humboldtiana as a synonym of S. butyracea. The

holotype (Spruce 43) of Attalea humboldtiana from Kew comprises only leaf material. Fruits were also collected, but apparently they have since been lost or misplaced. In his original article, Spruce emphasized the vertical rather than the normally horizontal arrangement of pinnae along the rachis (pinnae at right angles to the rachis). Dugand (1955) mentions photographs taken by Leopold Richter of abundant stands of this palm along the margins of the Bajo Guaviare and Orinoco rivers which demonstrate this characteristic. Later, Dugand said that S. humboldtiana is native to Venezuela, but not Colombia (see Moore, 1971). I have not seen any authentic specimens determined as S. humboldtiana other than leaf material (male flowers were not described by Spruce), therefore the status of this species is uncertain. Wessels Boer 1912 (U), cited above, from the Amazonas region of Venezuela, appears to be close to S. butyracea, but further study is necessary. The vertical arrangement of pinnae may be significant in delimiting S. humboldtiana as a separate species, but until I can examine more complete collections, I am tentatively keeping it in synonymy under S. butyracea.

Distributional data in Venezuela for S. humboldtiana is listed in FAO (Claassen et al., 1949), as follows: in upper Orinoco valley and its tributaries from Caura River to its tributaries in the state of Amazonas. Braun (1968) also lists the following localities for this species: region of Maypures, Upper Orinoco, Rio Casiquiare and Rio Negro (Amazon territory). Since neither author cites specimens, I can't be certain of the accuracy of this information.

S. cephalotes (Poeppig ex Mart.) Karsten, Linnaea 28: 269. 1857; Dahlgren pl. 371. 1959. Attalea cephalotes Poeppig ex Mart., Palmet. Orbign. 119. 1844; Mart., t. 169. 1845. Lectotype: Peru, Maynas Alto, Tocache (Poeppig 2000-W destroyed; M); c.f. Dahlgren 1959, pl. 371.

Specimens examined: Peru, Maynas Alto, Tocache, Poeppig 2000 (M, lectotype; BR). Doubtful. Peru, 1909-1914, A. Weberbauer 6762 (F).

Vernacular name: Shapaja

Distribution: recorded from Peru

No specimens were cited by Poeppig in the original publication, but Dahlgren's plate 371 of Poeppig 2000 from Vienna established it as the lectotype. Since most of the specimens deposited in the Vienna herbarium were destroyed during World War II, a duplicate specimen from Munich was chosen as the new lectotype.

This species seems to be most closely related to S. bassleriana from Peru mainly because both taxa have clustered pinnae and large fruits (about 10 cm long). The principal differences are in dimensions of the tree, pinnae and male rachillae. Unfortunately, only specimens from the type collection of S.

cephalotes have been seen, hence a careful comparison with the "better known" S. bassleriana is not practical at the present time.

S. excelsa Karsten, Linnaea 28: 267. 1857; Fl. Colomb. 2: t. 176, fig. 10-11. 1866; Dugand, Caldasias 3: 24-29. 1941.

Lectotype: Colombia, warm valleys of Magdalena and Cauca, up to 1,000 m. alt. (t. 176, fig. 10-11).

Specimens examined: Doubtful. Colombia, Dept. Bolivar, vic. of Estrella, Caño Papayal, pastureland and secondary forest, H. M. Curran 354 (US). Venezuela, Est. Barinas, near Barrancas, Bosque Experimental El Caimital, secondary forest, Wessels Boer 1990 (U); Schulz & Rodriguez 416, 417, 420, 423, 432, 433 (U).

Vernacular names: Palma de vino

Distribution: Colombia, mainly in the middle Magdalena region (fide Dugand); and Venezuela?, in estado Barinas.

No specimens were cited by Karsten in his original articles, nor could any specimens be found that could definitely be attributed to this taxon; hence the selection of Karsten's illustration as the lectotype. Problems concerning the type locality of S. excelsa was previously discussed under S. butyracea.

The above cited specimens from Utrecht were originally determined as S. butyracea by Wessels Boer, but collections with leaves (e.g. Wessels Boer 1990) have clustered middle pinnae like S. excelsa and the male flowers are 6-8 mm long. In Curran 354 (det. by Dugand) the male flowers are 14-16 mm. long, but contain no leaf material. Karsten described the male flowers as being about 5-10 mm. long. Both of the above specimens are within the graphical range of S. excelsa designated by Dugand, probably including the extension of the middle Magdalena region into Barinas in Venezuela.

As previously mentioned (under S. butyracea where S. excelsa was discussed in detail), more collections are necessary from various parts of these regions before the morphological limits and a more precise area for the type locality can be established.

S. huebneri Burret, Notizbl. 10: 633. 1929.

Holotype: Brazil (Amazonas), Rio Purus, Manaos (Huebner 23a-B).

Specimens examined: Brazil (see holotype above). Cultivated, Brazil, Hort. Rio de Janeiro, Capt. Johnstone 1846 (B). Doubtful. Brazil, Mato Grosso, region Machado, Ytaturassa, Krukoff 1615 (F-620747).

Vernacular name: Urucuri

Distribution: Brazil, in state of Amazonas.

Burret (1929) reported the distribution of this palm as Amazon region, lower Rio Purus in Igarapé and in Igapo (alluvial forest). The fruit is edible and also used for smoking rubber. Burret also mentioned two photos in connection with the cited specimen, but these were not found. Another photo of trees in their natural habitat taken by George Huebner in Manaus, 1935, is deposited in the herbarium at the Field Museum (#460079).

Scheelea huebneri appears to be a distinct species, but more collections are necessary to determine its range of variation and morphological limits.

S. insignis (Mart.) Karsten, Linnaea 28: 269. 1857; Dahlgren 1959, pl. 372-373. Maximiliana insignis Mart., Hist. Nat. Palm. 2: 133, t. 94. 1826. Attalea insignis (Mart.) Drude, Engl. & Prantl, Nat. Pflanzenf. 2: 80. 1887. Englerophoenix insignis (Mart.) Kuntze, Rev. Gen. Plant. 3: 322. 1898. Lectotype: Brazil, Japura, Rio Negro (Martius s.n. - M). c.f. Dahlgren 1959, pl. 372.

Specimens examined: Brazil, Japura, Rio Negro (see lectotype above); Brazil, Prov. Rio Negro, Martius s.n. (M); Amazonia, Basin of Rio Purus, Terr. of Acre, mouth of Rio Macauhan, Krukoff 5572, 5622 (A, NY). Doubtful. Brazil, Amazonia, Rio Purus, Terr. Acre, Krukoff 5618 (A, NY); Brazil, Cult. Jard. Bot. Rio, Dahlgren s.n. (F-611600); Java, Cult. Hort. Buitenzorg, Capt. H. A. Johnstone 1573, 1577a (B); Brazil, Cult. Bot. Gart. Mus. Goeldi, H. A. Johnstone 1093 (B).

In his original article, Martius (1826) stated the type localities as follows: "in horrendis sylvis ad Cataractus Cupatenses et Araracoara fluminis Japura, in ripa fluviorum Messai et dos Enganos in confinis Regni Quitensis et Provinciae Lusitanicae, quae de flumine nigro". Since no specimens were cited in any of Martius' articles (1826, 1845, 1853), a lectotype was chosen from one of Martius' specimens originally illustrated by Dahlgren (1959, pl. 372). This specimen (Martius s.n., Japura, Rio Negro) was chosen over the other collection (Martius s.n., Rio Negro) because the label is apparently in Martius' handwriting, whereas in the other collection someone else wrote the label.

Too few collections of S. insignis have been made to carefully determine its relationships, but it appears to be most closely related to S. excelsa from Colombia and Venezuela, which is itself a poorly known species.

S. Kewensis Hooker, Curtis' Bot. Mag. 123: t. 7552-7553. 1897. Lectotype: Cult. Kew Gardens, origin unknown (t. 7552-7553. 1897).



Specimens examined: Doubtful. Cultivated, Bot. Gardens Singapore, June 1933, C. X. Furtado s.n. (B); June 25, 1929, Nus s.n. [det. C. X. Furtado] (BH).

Vernacular names: none recorded

Distribution: Known only from cultivation.

No specimens were cited by Hooker nor could any be found which were collected in Kew Gardens; hence the selection of above illustrations as the lectotype.

This species is frequently known under the cultivation name of Attalea spinosa Meyen which actually has no botanical standing (nomen nudum). In fact, both specimens cited above were identified as such.

Scheelea kewensis seems to be a distinct taxon, but I have not examined enough material to make careful comparisons with other species. It would also be helpful to know where it came from originally.

S. lauromuelleriana Barb. Rodr., Contrib. Jard. Bot. Rio de Jan. 4: 108, t. 25. 1907.

Lectotype: Brazil, cult. Jard. Bot. Rio de Janeiro, 1926, (Dahlgren s.n., F-611607).

Specimens examined: Brazil (see lectotype above). Doubtful. Brazil (probably Jard. Bot. Rio de Janeiro), Dahlgren s.n. (F-404661).

Vernacular name: Baguaçu.

Distribution: Origin said to be from Minas Gerais, but now only known from cultivation.

No specimens were cited by Barbosa Rodrigues and hence t. 25 was originally chosen as lectotype by Glassman (1972). In 1892, the Jardim Botânico in Rio received for planting from Mr. J. C. Abreu, three young palms which came from the sertão in the state of Minas Gerais (locality not indicated). Between 1906 and 1907 these plants produced flowers and fruits. The specimens cited above are the only ones I have been able to locate with the label Scheelea lauromuelleriana. Dahlgren s. n. (F-611607) most probably was collected from one of the three original trees on which Barbosa Rodrigues based his description and illustrations. Hence, it is appropriate to select this collection as the lectotype instead of t. 25.

This species appears to be most closely related to S. attaleoides from Colombia because both taxa are acaulescent and have clustered pinnae. Further study is necessary, however, to determine its exact relationships.



S. leandroana Barb. Rodr., Plant. Nov. Cult. Jard. Bot. Rio de Janeiro 1: 19, t. 7, t. 8B, 1891; t. 44. 1903. Lectotype: Brazil, Cult. Jard. Bot. Rio de Jan., 1926 (Dahlgren s. n., F-61140).

Specimens examined: Brazil (see lectotype above), Doubtful: Brazil, Cult. Jard. Bot. Rio de Jan., 1926, Dahlgren s. n. (F-611617), (F-611597); Dahlgren & Millar s. n. (F-611651); cult. Rio de Janeiro, Sete (Lake) Pontes, Nov. 1, 1890, Glaziou 18587 (F,K,P).

Vernacular name: none recorded

Distribution: only known from cultivation.

No specimens were cited by Barbosa Rodrigues (1891,1903), but he mentioned number 453 (probably the tree number) and "country unknown". Originally, t. 7,8 B was chosen as the lectotype (Glassman 1972); however, Dahlgren s. n. (F-61140) is being selected instead because it is the only specimen I have seen labelled Scheelea leandroana and probably was collected from the original tree. All other specimens cited above were either undetermined or identified with other species names.

This taxon seems to be close to S. huebneri, but more specimens of both taxa should be examined before their exact affinities can be determined. Punt & Wessels Boer (1965) cited a specimen, H. A. Johnstone 1845 (B), which was identified as a hybrid between S. leandroana and S. huebneri. I have seen this particular specimen, but could not corroborate the determination because of insufficient material available for study.

S. liebmannii Becc., L'Agric. Colon. 10: 617. 1916; Miranda, 349-368, 1945; Hernandez X, 43. 1947; 18. 1949; Dahlgren pl. 374-375. 1959. (Described as new name for Cocos regia Liebm. because of existence of Scheelea regia Karsten, 1857). Cocos regia Liebm. ex. Mart., Hist. Nat. Palm. 3: 323. 1853.

Lectotype: Mexico, Dept. Vera Cruz, Xicaltepec, pr. Rio Nautla, 1841, Liebmann 6560 (C). c.f. Dahlgren 1959, pl. 374.

Specimens examined: Mexico (see lectotype cited above); Prov. (state) Vera Cruz, Monte Mistan, 1845, Galeotti 4977 (BR); banks of Arroyo, San Miguel outside Juanita, H.E. Moore 8056 (BH); betw. Tierra Blanca & Tres Valles, on road to Tlacotalpan, H.E. Moore & M. Cetto 6229 (BH); state of Oaxaca, wet wooded land on Isthmus road beyond Mathias Romero, 40 mi from Empalme Balboa, H. E. Moore & R. Brossard 6353A (BH); around Ubero & Almoloya, common in rough pasture or in clearings, L. Williams 9636 (F).

Vernacular names: Palma real (fide Galeotti), Coyol Largo (fide H. E. Moore)

Distribution: Native to Mexico in the states of Vera Cruz,

Oaxaca, Chipas, Tabasco, and Campeche (fide Hernandez X, 1949)

No specimens were cited in Liebmann (ex Martius, 1853) or Beccari (1916), therefore a lectotype was chosen. Dahlgren (1959) illustrated two photos (pl. 374-375) or specimens from (C) labelled Cocos regia or Scheelea liebmannii. Plate 375 has no collecting data and no. 6560? is written above the annotation label in a handwriting different from that below. The specimen was determined by Beccari, in 1916, in which the names S. liebmannii and Cocos regia were apparently inscribed on the annotation label by Beccari himself. No other information appears on this sheet which I have been unable to locate. I have chosen the other specimen (from plate 374) as the lectotype because information on the label seems to have been written by Liebmann and identified by him as well. Beccari probably did not see this specimen because it was not annotated by him.

In his article describing S. liebmannii as a new name, Beccari (1916) gave the following distributional information attributed to Liebmann: forests of eastern Mexico up to an altitude of 2500 ft., frequent in Antigua, Tolome, San Carlos and Colipa.

Miranda (1945) gave a detailed description of this palm, and Hernandez X (1949) presented a key to three species of Scheelea found in Mexico, based mainly on dimensions of fruit (also includes S. preussii and S. lundellii). Scheelea liebmannii differs from S. preussii (which also occurs in Guatemala) mainly in having clustered rather than non clustered middle pinnae; but it seems to be very closely related to S. lundellii (also found in Guatemala) and may even be conspecific with this taxon. Further study is necessary, however, before such a decision can be definitely made.

S. lundellii Bartlett, Carn. Inst. Wash. Publ. no. 461: 45, pl. 1-5. 1935; Standley & Steyermark p. 290, 1958.  
Holotype: Guatemala, Dept. Peten, Monte Polol (Lundell 3752 - MICH).

Specimens examined: Guatemala, Dept. Peten, Monte Polol, C. L. Lundell 3752 (MICH, holotype; GH, US, isotypes); Dept. Alta Verapaz, betw. Candelaria & Samanzana, Steyermark 45718a (F).

Vernacular names: Kantutz, Corozo.

Distribution: Native to Guatemala, but also reported from Mexico by Hernandez X (1949).

According to Standley & Steyermark (1958), S. lundellii grows in the same forests in Peten as Orbignya cohune which it resembles very closely in appearance.

Judging from the small number of collections, S. lundellii does not appear to be common because Guatemala has been well botanized by a number of collectors over the last 30 years. As previously mentioned, however, this species may be synonymous with S. liebmannii from Mexico which seems to have a wider distribution.

S. macrocarpa Karsten, Linnaea 28: 268. 1857; t. 176, fig. 12-15. 1866.

Lectotype: Venezuela, Rios Tuy and Jaracuy, sine loc. (Karsten s.n. - LE, not seen); c. f. Wessels Boer (unpublished ms.).

?S. passargei Burret, Notizbl. 10: 671. 1929.

Holotype: Venezuelan Guiana, without definite locality (Passarge s.n. - B).

Specimens examined: Venezuela, Est. Bolivar, near El Palmar, tropical rain forest, Wessels Boer 2105 (U); Est. Cojedes, along road from Tinaco to Valencia, pastures, alt. 500 m., Wessels Boer 2106 (U). Venezuelan Guiana, Passarge s. n. (B, holotype of S. passargei).

Vernacular names: Coroba (fide Claassen et al., 1949), Yagua, Corozo (fide Braun, 1968).

Distribution: Venezuela

In Glassman (1972) t. 176, fig 12-15 was listed as the type of S. macrocarpa. Wessels Boer (unpublished ms. on Venezuelan palms), however, cited a specimen collected by Karsten (consisting of a single fruit) as the lectotype. Wessels Boer (1972) transferred this species to the genus Attalea, but the combination is invalid because no basionym was listed in this article.

The description of S. passargei is based only on the fruit and the holotype itself consists only of a fruit as well. Wessels Boer (unpublished ms.) placed this species in synonymy under S. macrocarpa, but at present there does not seem to be enough evidence to make this judgement.

Scheelea macrocarpa is listed in Claassen et. al. (1949) and illustrated (fig. 19-21). It is called "Coroba" in Venezuela, and there are extensive stands (about six million trees) south of Lake Maracaibo and along the railroad and Zulia River near the Colombian border. Braun (1968) also lists S. macrocarpa from Rio Tui and Barlovento (state of Miranda) and is known as "Yagua" or "Corozo" in Venezuela. Since no specimens were cited in either one of these articles, I can't be certain if the identity of this species is correct.

S. macrolepis Burret, Notizbl. 10: 688. 1929.

Holotype: Venezuelan Guiana, Yopal (Passarge 774 - B, destroyed).

Specimens examined: Venezuela, Est. Bolivar, El Tigre Cerca de Rio Cuchivero, Middle Orinoco, Llewelyn Williams 13315 (F-617690).

Vernacular names: Coroba

Distribution: Venezuela

Wessels Boer (unpublished ms.) also cites the same collection above from (US) and (VEN) and Tamayo 3418 (VEN), from savannas of Cuchivero, which I have not examined. In 1972 he transferred this species to the genus Attalea, but the combination is invalid for lack of a basionym.

The FAO article (Claassen et. al., 1949) gives the following distributional data for S. macrolepis: along Orinoco River and its tributaries and common from Puruy near mouth of Caura River and beyond Caicara on the Orinoco. This palm grows in dense pure stands called "Corobales" in dry sandy soils at the edge of tropical forests bordering savannas or Caura and Cuchivero valleys an estimated 900,000 trees of this species occur. Since no specimens were cited in the FAO article, I cannot be certain all of the above information actually pertains to S. macrolepis.

S. magdalenica Dugand, Mutisia 26: 1. 1959.

Holotype: Colombia, Dept. Magdalena, Santa Marta, near Tucurinca (A. Schultze 707 - B, destroyed).

Lectotype: Colombia, Santa Marta (H.H. Smith 2639 - GH).

S. butyracea sensu Burret, Notizbl. 10: 685. 1929; not Cocos butyracea Mutis ex L. f., Suppl. 454. 1781.

Specimens examined: Colombia, Santa Marta, H.H. Smith 2639 (GH, lectotype: F, NY, P, US); Guajaro Lagoon, Dugand 558 (F); Dept. Magdalena, entre Pivijay and Medialuna, Najar 4A (COL); entre los puentes de la quebrada de Orihueca y del rio Sevilla, R. Romero - Castanedo 8225 (COL).

Vernacular names: Palma de vino, Curua, Corua.

Distribution: Colombia, in northern part of the valley of the Rio Magdalena, almost to the shore of the Caribbean sea, in the departments of Atlantico, Bolivar and Magdalena.

Since the holotype was presumably destroyed in Berlin, one of the paratypes (collected near the type locality) cited by Dugand was chosen as the lectotype.

Dugand (1959) distinguishes S. magdalenica from S. butyracea by having a fruit about twice as large (6-7.5 X 3-4.5 cm vs. 4-5 X 3 cm) and becoming orange rather than yellow at maturity; and from S. excelsa by having single rather than clustered pinnae. Dugand (1941) discusses in detail the distinction between geographical ranges of the three Colombian species

listed above, and also first mentioned the misapplication of S. butyracea by Burret from the species later described by Dugand as S. magdalenica.

Dugand (1959) says S. magdalenica used to be common in the region between Sabanalarga and Guajaro, and from there to Los Pendales to the West; and Puerto Giraldo and Suao to the east, in Dept. Atlantico, but tens of thousands of trees have been destroyed, and currently remain isolated in small groups. The greatest concentration of this palm was found in Magdalena between Medialuna and Pivijay, on the highway from Fundacion to Salamina; however these stands of trees are being cut down and burned, and the area converted to pasture.

S. maracaibensis (Mart.) Burret, Notizbl. 10: 676. 1929.

Attalea maracaibensis Mart., Palmet. Orbign. 124, 1844; t. 167, fig. 3. 1845; Wessels Boer, 1972.

Holotype: Venezuela, Maracaibo (Plee s.n. - P, destroyed?)

Specimens examined: Venezuela, est. Zulia, near Santa Barbara del Zulia, in pastures, Wessels Boer 2007 (U); est. Zulia, Perija, near Mission Los Angeles del Tucuco, forest at base of mountains, Wessels Boer 2463 (U).

Vernacular name: Palma de Agua

Distribution: Western Venezuela, common and locally abundant in the lower hot, humid lands encircling Lake Maracaibo and in the foothills of the mountains that surround the lake, up to 1000 m (fide Wessels Boer).

The holotype (Plee s.n. - P) was probably destroyed because neither Wessels Boer nor myself have seen this specimen.

Dugand (1941) said that S. maracaibensis (originally described by Martius solely on its fruit) seems to be close to S. butyracea from the coast of Colombia (later differentiated as S. magdalenica) because both species have small fruits and because of their geographical proximity.

According to Wessels Boer (unpublished ms.), Dugand (1959) refers plants in the vicinity of La Fria, est. Tachira (Venezuela) to S. macrocarpa without much evidence, and probably incorrectly. Nevertheless, he said that S. magdalenica appears to be identical to S. maracaibensis because he was unable to detect any major differences between the two taxa.

S. microspadix Burret, Notizbl. 15: 104. 1940.

Holotype: Brazil, Mato Grosso, without definite locality (W. Hopp 3010 - B).

Specimens examined: Brazil, Mato Grosso (see holotype above). Doubtful. Mato Grosso, Jacobina #1, O. Kuntze s.n. (BH),

Guacuril #2, O. Kuntze s.n. (BH).

Vernacular name: Acuri

Distribution: Brazil, in state of Mato Grosso.

Apparently, part of the holotype from (B) was destroyed because a photograph of another specimen bearing fruits and male flowers (Hopp 3010) was attached to the collection cited above (consisting of parts of a petiole, leaf rachis, spathe, female spadix and parts of a leaf; but no fruits or male flowers).

According to Burret (1940), S. microspadix belongs to the section of Scheelea called Synalphocaryum. Bundle fibers in the endocarp are conspicuous, pinnae are irregular, fruit is almost completely round (broadly rounded at base and apex) and perianth is low, and male flowers are on one side of the rachilla. Burret also distinguishes the species from S. phalerata, S. quadrisperma, S. parviflora, S. amyloacea and S. leandroana by having completely rounded rather than beaked fruits.

Scheelea microspadix seems to be most closely related to S. phalerata because both species have clustered pinnae and male flowers on one side of the rachillae; but they differ mainly in having 1-2 female flowers rather than about 8 female flowers per androgynous rachilla, respectively.

S. osmantha Barb. Rodr., Pl. Nov. Cult. Jard. Bot. Rio de Jan.

4: 24. 1894; t. 4B, 1896; t. 43. 1903.

Lectotype: Cult. Jard. Bot. Rio de Janeiro (Glaziou 16487 - MO).

S. urbaniana Burret, Notizbl. 10: 672. 1929; 14: 476-477. 1937.

Holotype: Tobago, Easterfield (Broadway 4015 - B, destroyed).

Lectotype: Tobago, Easterfield (Broadway 4015 - F).

S. curvifrons Bailey, Gentes Herb. 7: 443, fig. 206, 209-210. 1947.

Holotype: Trinidad, Leasehold Reservation, St. Patrick (L. H. Bailey 124-BH).

S. excelsa of Barb. Rodr., Pl. Nov. Cult. Jard. Bot. Rio de Jan. 1: 30, t. 9, fig. A1-8. 1891; not Karsten, 1857.

Specimens examined: Trinidad, Leasehold Reservation, Saint Patrick, L. H. Bailey 124 (BH, holotype of S. curvifrons); Horseshoe Reservation, Forest Reserve, Wessels Boer 1660 (U); Trinidad, cultivated, Lapeyhouse Cemetery, Broadway 8922 (F). Tobago, Easterfield, Broadway 4015 (F, lectotype of S. urbaniana; G); Mason Hall, Broadway 4744 (F, G, GH, NY, P, US). Venezuela, Est. Sucre, Penins. de Paria, near Yaguarapara, secondary forest, Wessels Boer 1837 (U). Cultivated. Surinam, Wessels Boer 1339 (U). Brazil, Jard. Bot. Rio de Janeiro, Glaziou 16487 (MO, lectotype of S. osmantha; BR, F, P); Dahlgren & Millar s.n. (F-611598).



Doubtful. British Guiana, Georgetown Bot. Garden, Dahlgren & Millar s.n. (F-610614, 610615, 610816).

Vernacular names: Trash palm (Trinidad).

Distribution: Native to Trinidad and Tobago; and Venezuela, in semi-dry deciduous forests (fide Wessels Boer, unpubl. ms.).

Known in cultivation from the following botanical gardens: Trinidad, Georgetown, Rio de Janeiro, Peradeniya, Buitenzorg and Surinam.

Barbosa Rodrigues (1891) originally described this taxon under S. excelsa, but could not use this binomial because it was pre-empted in 1857 by Karsten. In 1894, however, he changed the name to S. osmantha and at the same time added a description of the fruit. No specimens were cited by Barbosa Rodrigues here, but he listed no. 104 which may refer to the number of a tree growing in the Jardim Botânico in Rio. Label on specimen of Glazieu 16487 (MO) is inscribed "could be from type tree", but no. 104 is not on the sheet. Even though I am not certain if this specimen actually came from the tree based on the original descriptions, I am designating it as the lectotype. Previously, I had designated t. 4B, 1896 (Glassman, 1972) as the type because I was unaware of the existence of Glazieu 16487 at the time.

Burret (1937) first mentioned that S. osmantha was native to both Trinidad and Tobago (and placed S. urbaniana in synonymy) however, it is still uncertain where the original cultivated trees came from since Barbosa Rodrigues made no mention of it in any of his articles. From Trinidad Burret cited a specimen (which I could not locate) collected by "A. C. Langlois, Pt. a Pierre, Ferres Hill, Phoenix Park area, California Hill forest, area 3 mi. sq., were very common until area was cleared for sugar planting". Wessels Boer (unpubl. ms.) was apparently the first one to include both S. urbaniana and S. curvifrons as synonyms under S. osmantha.

S. parviflora (Barb. Rodr.) Barb. Rodr., Sert. Palm. Bras. 1: 53, t. 45A. 1903. Attalea parviflora Barb. Rodr., Bull. Herb. Boiss. ser. 2, 3: 625. 1903.

Holotype: Paraguay, Concepcion (Hassler 7165 - G).

?S. quadrisperma Barb. Rodr., Palm. Nov. Parag. 23, t. 6. 1899; t. 46A, 1903.

Lectotype: Paraguay, ripas Arroyo Y-aka in Pule-cus, near Santa Maria de la Sierra and in ripas Rio Apa (t. 6, 1899.). c.f. Glassman, p. 205, 1972.

?S. quadrisulcata Barb. Rodr., Contr. Jard. Bot. Rio de Jan. 4: 107, t. 22B. 1907.

Lectotype: Paraguay, near Villa Concepcion (t. 22B, 1907).

Specimens examined: Paraguay (see holotype of S. parviflora above).



Hassler 7165 is one of the few type specimens that can be attributed to a species described by Barbosa Rodrigues. In most cases, no specimens were cited and the handful that were listed have been destroyed.

No specimens were cited for S. quadrisperma by the above author, hence the selection of t. 6 as the type. Burret (1929) lists Glaziou 22268 as probably belonging to the above species, but he also cited it under S. phalerata (see following species). Burret also surmised that S. quadrisperma was perhaps identical to S. phalerata.

For Scheelea quadrisulcata, Barbosa Rodrigues (1907) stated that Dr. E. Hassler discovered this species in 1903 near Villa Concepcion, Paraguay, and subsequently sent him collections of this palm along with other specimens. Unfortunately, no specimens pertaining to this taxon have been found to date. Therefore, the above illustration (t.22B) was chosen as the lectotype.

This taxon needs further study because differences between it and other species collected in Paraguay have not been resolved.

Scheelea phalerata (Mart. ex Sprengel) Burret, Notizbl. 10: 669.

1929. Attalea phalerata Mart. ex Sprengel, Syst. Veg. 2: 624. 1825; Mart. t. 169, fig. 5, 1845; Drude t. 101, fig. 2. 1881.

Type: Brazil, Goias, exact locality not indicated (no specimens cited).

S. princeps var. Corumbaensis Barb. Rodr., Palm. Mattogross. 66, t. 21A. 1898; S. corumbaensis (Barb. Rodr.) Barb. Rodr., Sert. Palm. Bras. 1: 54, t. 47A, 1903.

Lectotype: Brazil, Mato Grosso, Corumbá (t. 21A, 1898).

Specimens examined: Brazil, central, Salinas, 1844, Weddell 2030 (P); Goias, near Morinhos, 1894, Glaziou 22268 (BR, P). Paraguay, between Rio Apa and Rio Aquidibán, Centurion, 1908, K. Fiebrig 4037 (GH).

Vernacular names: Acuri, Guacuri, Guriry, Cabeçudo (Brazil). Distribution: Brazil, in states of Goias and Mato Grosso; and Paraguay.

No specimens were cited by Martius in either article, nor could any be found at (BR), (M) or (P) which were annotated by him. Burret (1929), however, cited a specimen (Martius, non vidi) as follows: Goias, in pure stands, Vao do Paranã, "Cabeçudo". Apparently, some one sent the above information to Burret because he did not see this specimen. A continued search should be made for this specimen, but it probably has been lost or destroyed.

Barbosa Rodrigues (1898) cited B.R. 218 for S. princeps var.

corumbaensis, but this specimen was apparently destroyed. Therefore, t. 21A was chosen as its lectotype.

Burret (1929) cited both Glaziou 22268 and Fiebrig 4037. He also said that S. phalerata was probably identical to or related to S. anisitziana from Mato Grosso, and S. quadrisperma and S. parviflora from Paraguay. Even though key characters have been used to separate the above species, further study is necessary to completely differentiate them.

S. preussii Burret, Notizbl. 10: 678. 1929; Hernandez X., 145-152. 1945; Standley & Steyermark, fig. 50. 1958.  
Holotype: Guatemala, Pacific side, very common (Preuss s.n. - B).

Specimens examined: Guatemala (see holotype above); Dept. San Marcos, Palmetto flats, 1-2 mi no. of Ocos, Steyermark 37869 (F); Dept. Suchitepequez, So. of Alotenango Farm, 7 mi So. of Tiquisate, along road, Steyermark 47732 (F); Dept. Retalhuleu, mixed forest betw. Retalhuleu and Nueva Linda, Standley 87258, 87277, 87289, 87314 (F); Dept. Retalhuleu, vic. of Las Delicias, So. of Retalhuleu, abundant on plains, tree left where land was cleared, Standley 92369 (F). Doubtful. Nicaragua, Dept. Bluefields, Bluefields, L.E. Long 154 (F).

Vernacular names: Coquito, Corozo.

Distribution: abundant in plains along Pacific side of Guatemala; and Mexico, in state of Chiapas (fide Hernandez X.).

Scheelea preussii is one of five species of Scheelea described (and recognized by me) from Central America. It is readily distinguished from S. liebmannii from Mexico and S. lundellii from Guatemala by having pinnae arranged singly rather than in clusters; however, S. preussii seems to be closely related to both S. rostrata from Costa Rica and S. zonensis from Panama. In fact, all three may be conspecific, but more careful study is necessary before such a decision can be made.

S. princeps (Mart.) Karsten, Linnaea 28: 269. 1857; Barbosa Rodrigues, p. 65. 1898; t. 47C, 1903. Attalea princeps Mart., Palmet. Orbign. 113, t. 4, fig. 3, t. 31B, 1844. Type: Bolivia, prov. Moxos and Chiquitos, in large groups in humid forests (D'Orbigny 16-P, destroyed?). Lectotype: Martius, t. 31B, 1844.

Vernacular name: Motacú.

Distribution: Bolivia

Even though I have not seen any authentic specimens of this taxon, the description is adequate to maintain it as a separate entity, for the present time. Very few species of Scheelea

have been reported or collected from Bolivia, so comparisons should be made with taxa found in Mato Grosso, Brazil, which is the adjacent state to the east of Bolivia.

S. rostrata (Oersted) Burret, Notizbl. 10: 688. 1929; N.W.

Uhl & H. E. Moore, Principes 17: fig. 7B. 1973. Attalea rostrata Oersted, Vidensk. Meddel. Kjoeb. 1858: 50. 1859.

Type: Costa Rica, west coast near Puntarenas (no specimens cited).

Specimens examined: Costa Rica, Puntarenas, abundant in open pasture near Puerto Cortez, H. E. Moore 6540 (BH); Prov. Puntarenas, Cabo Blanco Nature Reserve, So. tip of Nicoya Penins., secondary vegetation, W. C. Burger & R. L. Liesner 6696 (F).

Vernacular name: Corozo

Distribution: Northwestern Costa Rica and adjacent Nicaragua, primarily in bottom land and hillside forests.

In 1977a, I considered this taxon as a species incerta under Attalea because male flowers were not known at the time Burret transferred it to Scheelea. When my article was written, however, I was not aware of the existence of the complete collections (cited above) from the general area of the type locality. Uhl & Moore (1973) cited Moore 6540 in an article on "Protection of pollen and ovules in palms".

As previously mentioned, S. rostrata is most closely related to S. preussii and S. zonensis.

Janzen (1971) studied five separate populations of S. rostrata in northwestern Costa Rica with relation to damage of fruits by rodents and Bruchid beetles. He gave the following information on these locations: 1. Barranca site - on hills and bottom-lands 5-8 miles northwest of Puntarenas, area extensively cleared for cultivation, but with 1000-2000 estimated trees. 2. Taboga site - river bottoms along Rio Higueron on Finca Taboga, south of Canas, Guanacaste province, about 200 individuals confined to a narrow strip of forest remaining along the river and the contiguous palm forest of about 10 acres. 3. Colorado site - pastures along the creek network about halfway between Barranca and Toboga sites, only 13 trees remaining of undoubtedly a much larger population. 4. Esparta site - at least 1000 palms scattered among hillside pastures and clumped in some creek bottoms 3-6 miles northeast of Esparta, Puntarenas province. 5. Penas Blancas site - separated from the Toboga site by 90 miles of forest with a very severe dry season, extends along Pan American highway from Costa Rican - Nicaraguan border to 10 miles south and extends north into Nicaragua for an unknown distance along river draining into Lake Nicaragua; probably less than 200 individuals, but this population may extend eastward and thus be continuous with a large population on the Atlantic Coastal plain.

S. tessmannii Burret, Notizbl. 10: 682. 1929.

Holotype: Peru, Upper Amazon, Iquitos, in flooded or dry highlands (Tessmann 5085-B).

Specimens examined: Peru, Iquitos, Tessmann 5085 (B, holotype; NY, isotype); Peru, Iquitos, Tessmann 5088 (NY).

Vernacular name: Chapaja

Distribution: Peru, Iquitos

The holotype (B) consists of a piece of wood and part of a spathe, whereas the isotype (NY) comprises female rachillae and female flowers. I considered calling this a species dubia because no leaves were described or collected until I discovered Tessmann 5088 (NY) which was not cited by Burret nor determined to species. This specimen matches Burret's description of S. tessmannii in the unusually long male rachillae (42-46 cm) with male flowers 16-17 mm long and spirally arranged around the rachilla.

Scheelea tessmannii is probably most closely related to S. bassleriana, differing mainly in the length of the male rachillae (42-46 cm v s. 17-34 cm ).

Unfortunately, I could not include S. tessmannii in the key to species of Scheelea because of lack of leaf material.

S. weberbaueri Burret, Notizbl. 10: 659. 1929.

Holotype: Peru, Dept. Junin, Prov. Tarma, La Merced by Chanchamayo - Tal, in forests (Weberbauer 1848-B).

Specimens examined: Peru, Dept. Junin (see holotype above); Dept. Junin, along Rio Perene, near Hacienda Colonia Perene, forest, E. P. Killip & A. C. Smith 25141 (F, NY, US).

Vernacular name: Shapaja

Distribution: Peru, Dept. of Junin

Holotype consists of fruit only; the remaining specimens of this collection were probably destroyed. Killip & Smith 25141 was determined by Burret.

Scheelea weberbaueri seems to be a distinct species with its relatively short male flowers (5-6 mm) arranged on one side of the rachilla, short male rachillae (9 cm ) and rather large fruits (8 cm x 3-4 cm ). As previously mentioned, it is one of four species of Scheelea being recognized from Peru.

S. zonensis Bailey, Gentes Herb. 3: 37, figs. 20-23. 1933.

Lectotype: Panama, Barro Colorado island, Canal Zone

(L.H. & E.Z. Bailey 1-BH).

Specimens examined: Panama, Barro Colorado Island, Bailey & Bailey 1 (BH, lectotype); Barro Colorado Island, Snyder Molino Trail 10, T. Croat 4600 (F); Canal Zone, forest north of Golf Club at summit, T. Croat 16649 (F).

No specimens were cited by Bailey, hence the selection of the above specimen as lectotype.

As previously mentioned, S. zonensis seems to be closely related to S. preussii from Guatemala and S. rostrata from Costa Rica and may even be conspecific with both of them.

### Species Incertae et Dubiae

S. blepharopus (Mart.) Burret, Notizbl. 10: 674. 1929.

Attalea blepharopus Mart., Palmet. Orbign. 116, t. 5, fig. 2, t. 31C. 1844; Hist. Nat. Palm. 3: t. 167. 1845.

Type: Bolivia, prov. Yuracares, by Molito (D'Orbigny 34-P, destroyed?).

Burret (1929) transferred this species to Scheelea without explanation, but probably because male flowers were described as fleshy by Martius (1844). Male flowers illustrated by Martius (t. 167), however, appears to have flattened petals. Since no specimens have been seen which can be attributed to this taxon and since the description is inadequate to even designate the genus, it should be deemed a species dubia.

S. costaricensis Burret, Notizbl. 10: 684. 1929.

Type: Costa Rica (C. Hoffman s.n. - B, destroyed).

The description of this palm was based on fruits only and has no record of a specific type locality. Burret said that the fruit of this species is similar to S. excelsa from Colombia.

Because of the incredibly inadequate information available, S. costaricensis unquestionably belongs in the category of species dubia.

S. cubensis Burret, Notizbl. 10: 671. 1929.

Holotype: Cuba (Gundlach s.n. - B).

Specimens cited: see holotype above.

The situation here is similar to S. costaricensis in that the description was based on fruits only and there is no known type locality. Burret noted the similarity of the fruit of S. cubensis with S. princeps Mart.

In his flora of Cuba, Leon (1946) offered no new information except that Gundlach probably did not collect the fruit himself

because he had no knowledge of where it came from. Rather than speculate as to the identity and type locality of S. cubensis, I prefer to give it the obvious designation of species dubia.

S. goeldiana (Huber) Burret, Notizbl. 10: 658. 1929. Attalea goeldiana Huber, Bull. Herb. Boiss. ser. 2, 6: 268. 1906.  
Type: Brazil, Rio Acre (no specimens cited)

Huber's description contains very little information for identification of this palm; no illustrations were included and no specimens were cited, nor could any be found. Therefore, S. goeldiana has been placed in species dubia (Glassman, 1977a).

S. gomphococca (Mart.) Burret, Notizbl. 10: 666. 1929. Attalea gomphococca Mart., Hist. Nat. Palm. 3: 301, t. 167, fig. 6. 1845.  
Lectotype: Central America (t. 167, fig. 6). c.f. Glassman 1972, p. 24.

No specimens were cited by Martius (1845), hence a lectotype was chosen from his illustration of the fruit. Unfortunately, this name is based only on a description and illustration of the fruit and furthermore is without a precise type locality. Therefore, S. gomphococca is unquestionably a species dubia (see Glassman, 1977a).

S. martiana Burret, Notizbl. 10: 661. 1929.  
Type: Published as new name for Attalea excelsa because a Scheelea excelsa Karsten, 1857 already existed.  
Attalea excelsa Mart. ex Sprengel, Syst. Veg. 2: 624. 1825; Mart., t. 96, fig. III, 1-2. 1826; t. 169, fig. 3. 1845.  
Type: Brazil, Maranhão and Pará (no specimens cited).

Specimens examined: Doubtful. Brazil, Pará, Tapajos, Boa Vista, lowland, Capucho 516 (F).

Vernacular name: Urucuri

Burret (1929) transferred this taxon to Scheelea based on presence of fiber clusters in endocarp of the fruit (since male flowers were neither described nor illustrated by Martius). This is a questionable distinction because many species of Attalea and Orbignya also have fiber clusters in the endocarp. According to Burret, S. martiana is closely related to S. huebneri from the Amazon region, but it differs in having a shorter elliptical fruit with a shorter perianth.

Since this species is based largely on a delineation of the fruit (and almost no other information), and since no authentic collections have been seen which can be definitely attributed to it, I am compelled to relegate S. martiana to species dubia.



S. tetrasticha (Drude) Burret, Notizbl. 10: 667. 1929; Dahlgren, pl. 376. 1959. Maximiliana tetrasticha Drude, Mart. Fl. Bras. 3: 455. 1881. Englerophoenix tetrasticha (Drude) Barb. Rodr., Sert. Palm. Bras. 1: 76. 1903.  
Holotype: Brazil, forests on Rio Tocantins and Rio Araguaia (Weddell 2331-P).

Specimens examined: Brazil, border of Rio Tocantins, 1844, Weddell 2331 (P, holotype; F, isotype).

Vernacular name: Anaja.

The type material consists of leaf parts (pinnae are clustered, but are not from the middle) and a packet of male flowers (7 mm long). This species is very poorly described, (no spadices or female flowers) and the type specimens are inadequate to distinguish it as a separate entity. Until more material can be collected from the type locality, I am considering S. tetrasticha as a species dubia.

S. wallisii (Huber) Burret, Notizbl. 10: 657. 1929; Notizbl. 11: 1048. 1934. Attalea wallisii Huber, Bull. Herb. Boiss. Ser. 2, 6: 267. 1906.  
Type: Brazil, Amazonas, Rio Purus (no specimens cited).  
Lectotype: Brazil, Rio Purus, mündung des Rio Acre (leg. A. Ducke, com. G. Huebner 163-B).

Specimens examined: Brazil (see lectotype above); Rio Purus, Rio Acre, leg. Lako com. Huebner s.n. (B).

Vernacular name: Jacy

Huber's description is mainly a comparison of characters with Attalea (Scheelea) humboldtiana which it most closely resembles. Burret (1929) probably transferred this species to Scheelea because of its resemblance to S. humboldtiana, but male flowers were not known. In 1934, Burret described S. wallisii in detail and cited the above specimen chosen here as lectotype (Huebner 163-B). In none of the articles, however, are male and female flowers described. The specimens cited above consist of parts of a female spathe and spadix (but no flowers), part of a leaf and an immature fruit. Since S. wallisii is incompletely known, I am compelled to relegate it to species dubia.

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(An additional manuscript with descriptions and synonymy of the taxa mentioned above was prepared by Wessels Boer, but never published.).